Chemical Engineering Program

Modeling & Design of Nanostructured & Low Dimensional Materials for Energy Harvesting, Conversation and Storage

Dr. Tahir Cagin

April 08, 12-01PM

Lecture Hall 238

(Pizza will be served)

Using various levels of theory we study materials and materials systems for energy conversion and storage applications. In these studies, we employ methods such as ab initio quantum chemistry, classical molecular dynamics, Monte Carlo and equilibrium and non-equilibrium statistical mechanics. To assess the efficiency of materials and materials systems for energy conversion application, the quantities of interest are the coupling coefficients: for instance like thermal-electrical, mechanical-electrical, chemical-electrical, mechanical-thermal-magnetic couplings for thermoelectrics, piezoelectric materials, fuel cell materials, magnetic-shape memory alloys, or magneto-caloric materials, respectively. In addition to materials for energy conversion, we will also discuss nanostructured materials for hydrogen storage and supercapacitor applications.

Dr. Tahir Cagin

He is currently holding Professorship at Chemical Engineering, and Materials Science programs (served as Chair between 2008-2010 and serving as the executive committee member) at Texas A&M University. He is also serving as the member of graduate faculty for the Mechanical Engineering Department. He is a well-known expert in modeling and simulation of nanomaterials for a wide range of applications. For his work in nanotechnology he was awarded the Feynman Prize in Nanotechnology in 1999. Dr. Cagin is born in Izmir, Turkey, where he received basic and high school education. He has completed his BS and MS degree in Physics at Middle East Technical University, Ankara. He has completed his Ph. D. in Physics at Clemson University, 1988. He has spent 18 months as a postdoctoral fellow at University of Houston, Chemistry Department. After serving a year as a research associate at the Materials Laboratory of Wright Patterson AFB, he has joined Molecular Simulation Inc. (Presently Accelrys) where he has spent around four years as senior research and development scientist, product manager and research director. In the summer of 1995, he has joined Caltech, Materials and Process Simulation Center, as senior research scientist. He has moved to Texas A&M University in 2005 as a professor of Chemical Engineering. Over the last 20 years he has developed and applied multi scale simulation methods into various materials science and engineering problems; such as the material behavior under extreme environmental conditions through various stages leading to material failure (stress corrosion, metal dusting, etc.). His notable research is in the area of nano science and nanotechnology areas with a particular focus on the materials for energy harvesting, conversion and storage (thermoelectrics, photovoltaics, piezoelectrics, fuel cells, supercapacitors, etc.).

FOR MORE INFORMATION:
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